MERCURY SWITCH REMOVAL from MOTOR VEHICLES in MAINE

Second annual report to the Mercury Products Advisory Committee

Prepared by the Maine Department of Environmental Protection
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I. Introduction and program overview

This is the second annual report on the effectiveness of the source separation program established under Title 38, section 1665-A, of the Maine Revised Statutes Annotated [38 MRSA §1665-A; see Appendix A]. This law requires mercury switches and mercury headlamps to be removed from motor vehicles before they are crushed and shredded for the scrap metals market. The purpose of this source separation requirement is to reduce mercury emissions from steel mills that use automobile scrap. If the switches are not removed, the mercury is vaporized and released into the environment when the scrap metal is melted in furnaces to make new steel.

Over 99% of the mercury in motor vehicles is found in switches. Most of these are tilt switches used to operate convenience lights under the vehicle hood or trunk lid. Automakers ended their use of these switches in new vehicles beginning with model year 2003, but mercury switches in older U.S. motor vehicles currently are a significant source of mercury emissions to the environment and will remain so unless the switches are removed and recycled when the vehicles are scrapped.

Under section 1665-A, responsibility for removal and recycling of the mercury switches is shared as follows:

- Automobile dismantlers and others who handle end-of-life vehicles (ELVs) are required to remove the switches, safely store them and deliver them to a consolidation facility[1] within 3 years of removal;
- Automakers are required to establish consolidation facilities, pay $1 for each mercury switch delivered to the facilities, and ship the switches to a recycling facility; and
- The Department of Environmental Protection (DEP) is required to provide information and training to facilitate the removal and recycling of the mercury components.

The DEP also is required to file this annual status report with the Mercury Products Advisory Committee (MPAC).[2] The report is due January 1 each year and must address the following:

- Whether the $1 switch bounty should be adjusted to increase the number of switches brought to consolidation facilities;
- Whether other motor vehicle components should be included in the program; and
- Whether the program should be terminated and, if so, when.

The factual and policy basis of the program, its legislative history and initial implementation are thoroughly discussed in the DEP *Plan to Reduce Mercury Releases from Motor Vehicles in Maine* (January 2002) and in our first annual report to the MPAC. Copies of these documents can be obtained from the DEP. See cover page for contact information.

[1] The term "consolidation facility" as used in the Maine Hazardous Waste Management Rules means a facility where mercury switches or other "universal wastes" are collected and temporarily stored while awaiting shipment to a recycling, treatment or disposal facility. See rules of the Department of Environmental Protection, chapter 850(3)(A)(13)(a).

[2] See 38 MRSA § 1665-A, sub-§ 9 and § 1670. The 13-member Mercury Products Advisory Committee advises the DEP and Legislature on actions to prevent and reduce environmental releases of mercury from consumer products.

II. Number of mercury switches collected

Automakers have hired Wesco Distribution, Inc. to collect and consolidate the mercury switches once they are removed. It is the responsibility of those removing the switches to deliver the switches to Wesco. The switches may be delivered to Wesco at its facilities in Bangor and Portland during regular business hours. Wesco will accept delivery of switches with or without the Vehicle Identification Numbers (VINs) from the source vehicles, but automakers will not pay the $1 per switch bounty unless VINs are provided.

Wesco reports that it accepted two deliveries totaling 804 switches in 2004. This brings the total number of mercury switches delivered to Wesco during the first two years of the program to 2,417. These switches originate from just four of several hundred Maine facilities that dismantle and scrap vehicles.

In last year's report, we speculated that these low numbers are not evidence of wide non-compliance with the switch removal law, but rather reflect the fact that most ELV handlers have not accumulated sufficient numbers of switches to warrant driving to Bangor or Portland to turn them in. We remain confident, in light our extensive outreach effort, that ELV handlers are aware of the law and are removing mercury switches. Our initial site visits have confirmed this.

To assess participation, the Natural Resources Council of Maine (NRCM) conducted a phone survey between September 13 and October 11, 2004. The survey results (see Appendix C) indicate that 80% of those in the business of dismantling or "parting-out" autos are removing mercury switches, and that over 14,479 switches currently are on hand at these facilities awaiting delivery to Wesco. Combined with the 2,417 switches already delivered to Wesco, this brings the total number of switches collected during the first 22 months of the program to about 17,000.

Assuming each switch contains one gram of mercury, the program has captured about 37 pounds of mercury so far. This is significant but only about 30% of what was available for collection based on estimates provided by the Alliance of Automobile Manufacturers[3] and the Clean Car Campaign.[4]

III. Strategies to improve switch collection

The DEP plans to improve the mercury switch capture rate by continuing our efforts to promote awareness of the program through outreach and compliance assistance; by taking enforcement action where warranted; and by increasing the bounty that automakers must pay for each switch delivered to Wesco.

[3] The Alliance of Automobile Manufacturers is a trade association of motor vehicle manufacturers including BMW Group, DaimlerChrysler, Ford Motor Company, General Motors, Mazda, Mitsubishi Motors, Porsche, Toyota and Volkswagen.

[4] The Clean Car Campaign is a national campaign coordinated by state, regional and national environmental organizations promoting the development and sale of motor vehicles that meet a high standard of environmental performance.

A. Outreach and compliance assistance

During the first two years of the program, the DEP has focused its efforts on education and outreach—on identifying ELV handlers, telling them about the new law and providing guidance on how to comply. We held regional workshops, produced and distributed an instructional video and guidance manual, and revised the Maine Hazardous Waste Management Rules to establish streamlined "universal waste" requirements that make it easy to store, transport and recycle the mercury switches. ELV businesses also have been given log sheets and a lidded storage bucket to facilitate compliance with the rules.

In November and December 2003, a company called Market Decisions conducted a mail survey to assess the effectiveness of the DEP outreach efforts. The survey results were not available in time for inclusion in our first report on the program last year, but are attached here as Appendix D. Eighty-four percent of the 277 survey respondents said they were aware of the switch removal program and most said they had heard of the program either by attending a DEP workshop or reading about it in a DEP newsletter. Seventy-six percent said that DEP assistance, including the written guidance manual, training sessions and secure storage buckets, encouraged their participation.

The DEP will continue its efforts to keep ELV handlers informed about the program through a newsletter, press releases and informational mailings as appropriate. [Examples of these materials and press coverage of the program are included in Appendix G.] We also have hired a Conservation Aide to visit ELV facilities and provide on-site compliance assistance, including transport of switches to Wesco.

B. Enforcement

Automakers have recommended that the DEP make frequent visits to auto salvage yards to reinforce the importance of switch removal. Yard visits are critical, according to automakers, because they demonstrate that the program is a priority for the DEP and that it is serious about enforcement. Automakers believe that a strong enforcement posture on the part of the DEP could eliminate the need for a bounty. In their view, the desire to avoid fines would provide the incentive necessary to assure program participation.

The DEP agrees site visits are important. We also recognize the need to move beyond compliance assistance and take enforcement action against anyone who still is crushing cars with the mercury switches intact. In anticipation of a stronger focus on enforcement, the DEP has proposed legislation to:

1. Authorize municipal code enforcement officers to enforce the switch removal requirement;
2. Rewrite the switch removal requirement under 38 MRSA §1665-A(3) to address concerns about the enforceability of current language; and
3. Define the term "scrap recycling facility" as used in that section.

A copy of proposed legislation—*LD 185: An Act to Amend the Law on Mercury-added Products*—appears in Appendix B.

To date, we have yet to substantiate violations of the switch removal requirement, either during site visits connected with our outreach effort or during investigations of citizen complaints lodged against auto salvage yards. Most complaints involve alleged mishandling of gasoline, oil and other fluids rather than mercury switches, although DEP enforcement staff now routinely checks for compliance with the switch removal law when investigating any complaint.

The lack of documented violations reflects the difficulty of enforcing the law by strictly policing the hundreds of ELV facilities in Maine.[5] One alternative may be to narrow our enforcement focus to car crushing operations. Only about 15 to 20 of the ELV facilities in Maine are known to have a crusher. Most vehicle crushing is done by mobile crusher crews that travel from facility to facility. The DEP held a training session on mercury switch removal for crusher operators in June 2003, but the job of monitoring for compliance would be greatly enhanced if DEP had advance notice of where and when car crushing will take place.

C. Raising the bounty to compensate ELV handlers for switch removal costs

The law [38 MRSA §1665-A(5)(B)] currently requires automakers to pay "a minimum of $1 for each mercury switch …as partial compensation for the removal, storage and transport of the switches." We now are convinced, based on feedback from dismantlers and salvage yard operators, that the $1 bounty is not enough even as partial compensation.

While we agree with automakers on the need to take enforcement action where warranted, we do not agree with their suggestion that a strong enforcement posture would substitute for a bounty, or that a bounty is inappropriate as a matter of public policy. We continue to believe that the bounty, if set at an appropriate amount, will make switch removal less onerous for Maine businesses that scrap vehicles and will increase their buy-in to the removal effort.

Nor is there any question as to the legality of the bounty. The U.S. District Court of Maine has upheld the bounty against a constitutional challenge by the Alliance of Automobile Manufacturers. In her decision the dismissing the Alliance's suit, Judge Margaret Kravchuk observed:

> "[I]t is not excessively burdensome to impose on those who placed mercury switches in interstate commerce a reasonable financial obligation to help ensure that the encapsulated mercury does not cause harm to public health or the environment. Although the Alliance concedes that the recovery and consolidation initiatives are laudable, they essentially

[5] At the outset of the program, the DEP compiled a mail list of over 700 municipally-licensed automobile graveyards and automobile recycling businesses. It has become clear, however, that as many as half of these facilities are not in the business of dismantling or otherwise processing ELVs. The department is refining the facility list in response to feedback from program mailings, information gathered through site visits and contact with municipal officials.

> believe that fairness requires the burden to be carried by Maine taxpayers and the so-called ELV industry. That the Legislature chose to encourage dismantler compliance with carrots…is perfectly reasonable given the large number of dismantlers distributed throughout the state. Whatever fairness may require, the [Commerce Clause of the U.S. Constitution] does not preclude the bounty scheme per se. Finally, the Alliance ultimately fails to make any factual showing in support of its conception of fairness. What is offered is that the manufacturers estimate the cost of compliance to amount to roughly $200,000 in start up costs and project annual costs of $120,000. In my view, this simple showing falls short of demonstrating a clearly excessive burden in relation to the local benefit of recovering mercury switches…"

The court's full decision is included in Appendix E.

The fundamental issue is how to fairly allocate the costs of removing the switches. In the absence of a bounty, these costs fall entirely to ELV handlers. Certainly they are in the best position to physically perform this task, and the law requires that they do so. However, their ability to recover mercury collection costs through the sale of used parts is limited. The ELV industry exists because many used auto parts have resale value; mercury switches do not. Mercury switches, in fact, have negative value because they must be handled as hazardous waste.

Automakers suggest that this economic disincentive to removal and recycling of the switches can be overcome through enforcement. The Maine Legislature instead chose to require automakers to pay a modest bounty as a means of partially compensating ELV handlers for costs they otherwise cannot recover. The fact that the Legislature accomplished this purpose by shifting some financial responsibility to automakers is consistent with the principle of product stewardship. Under this principle, manufacturers increasingly are being called upon to help with the waste management challenges they have created due to the volume or toxicity of their products (e.g., thermostats and electronics).

The DEP now is proposing to raise the bounty to more fairly compensate ELV handlers for their efforts. In advising the Legislature that a $1 bounty likely would be adequate, we under-estimated removal costs and did not anticipate the need to copy down the VIN of each vehicle.

Automaker insistence on having the VIN as a prerequisite to paying the bounty has largely removed any financial incentive that the current $1 bounty may have provided. Recording the VIN could easily double the time required to remove and handle the switches, thereby increasing the overall cost of removal. It is the most frequent complaint made about the program by those responsible for removing switches. Many dismantlers and salvage yard operators have said they would forego the bounty if it means they can avoid writing down VINs.

Even if automakers were to drop the VIN requirement, it is now clear that $1 does not adequately compensate ELV handlers for their trouble. In previously suggesting that a dollar would suffice, we observed that most switches could be removed in a minute or less, and we

calculated the removal costs as ranging from 38¢ to $l.71 depending on labor rates. These removal times are accurate but there is more to the job than simply removing the mercury switch from its assembly.

A March 2004 report on a switch removal pilot project initiated by the New Jersey Department of Environmental Protection shows that, although it generally takes less than a minute to remove the switches, it takes another 2 to 3 minutes to inspect the hood and trunk of each vehicle to determine if a switch assembly is present. The New Jersey report suggests that total removal time may be closer to 4 minutes per vehicle when all aspects of the job are considered, including vehicle inspection, switch removal and handling, maintaining a written log, and transporting the switches for recycling. The report estimates the total cost of removing and managing mercury switches to be $3 per switch even without recording VINs. See Appendix F for copy of the New Jersey report.

On October 25, 2004, the New Jersey General Assembly, by a vote of 70 to 3, passed a bill (A2482, 211th Legislature) that would require vehicle recyclers to remove mercury switches prior to delivery of ELVs to a scrap recycling facility and require automakers to pay a minimum of $2 per switch in partial compensation to the recyclers. An identical bill (S1292, 211th Legislature) was unanimously approved by the Budget and Appropriations Committee of the New Jersey Senate on February 7, 2005, and is expected to be acted on by the full Senate soon. No other state has enacted a switch removal requirement, although several states, including Colorado, Minnesota, New Hampshire, Pennsylvania and Wisconsin have voluntary programs. Some of these voluntary programs include financial incentives, although in no case are we aware of payments exceeding $1 per switch.

The mercury products bill[6] attached as Appendix B would, among other things, raise Maine's bounty on automotive mercury switches to at least $3, and to a minimum of $4 if automakers continue to require VINs as a prerequisite to paying the bounty. The DEP met with automakers in October to discuss this proposal. Our understanding from that meeting and from remarks made by an industry representative at the MPAC meeting of December 15, 2004, is that automakers are amenable to underwriting some program costs, including the distribution of promotional material and the cost of recycling the mercury switches once they have been removed, but they remain opposed to making direct payments to ELV handlers.

IV. Other mercury-added vehicle components

No information has been brought to the department's attention in 2004 to suggest that mercury-added automobile components other than switches and HID headlamps should be targeted for collection. The industry has reported that the only other mercury-added components currently used in motor vehicles are backlighting for instrumentation panels and flat panel displays for entertainment and navigation systems. The sale of new motor vehicles in Maine containing these miscellaneous components is estimated to place a total of about 2 ounces of mercury in commerce each year. This is not an amount that would appear to warrant a targeted collection effort.

[6] The bill has been introduced to the 122nd Maine Legislature as LD 185.

The DEP has provided ELV handlers with information on how to recycle HID lamps but has not attempted to gather information on how many are actually recycled by ELV handlers. The number is assumed to be low due to the fact that these lamps are expensive options and have value as used parts. Any HID lamps that are not broken when they arrive at an ELV facility presumably are placed in stock for resale.

Although very few HID headlamps appear to be recycled, the fact that mercury headlamps are targeted by Maine's source separation law has provided an opportunity to educate ELV handlers about the need to recycle all mercury-added lamps, including the 4-foot fluorescent tubes commonly used for shop lighting.

V. Should the mercury switch removal program be terminated?

The following table sets forth estimates of the numbers of mercury switches expected to be available for collection from ELVs in Maine over the next 10 years.

Table 1: Estimated number of mercury switches in end-of-life vehicles

	Clean Car Campaign	Alliance of Automobile Manufacturers
2005	30,724	22,431
2006	29,662	20,839
2007	28,380	19,135
2008	26,986	17,374
2009	25,086	15,553
2010	23,260	13,694
2011	21,414	12,043
2012	19,676	10,531
2013	18,051	9,061
2014	15,401	7,715

The steady downward trend in numbers reflects the fact that vehicles assembled in the late 80s and early 90s—the peak years of mercury switch usage—already have reached Maine's junkyards. The number of mercury switches installed by automakers declined steadily during the 1990s and ended altogether with model year 2003.[7] Accordingly, the number of switches available for collection in future years also can be expected to steadily decline as older vehicles disappear from the fleet.

Eventually, the number of switches available for collection will no longer warrant a statewide collection effort and the program can be terminated. However, it would be premature to end the

[7] To ensure this practice ends, the Legislature specifically banned the use of mercury switches in new motor vehicles sold in Maine after January 1, 2003 unless an exemption is obtained from the Commissioner of Environmental Protection. See 38 MRSA § 1665-A, sub-§ 1. One such exemption has been granted. In a decision dated August 19, 2003, the commissioner granted an exemption allowing motor home manufacturers to install gas ovens that use mercury flame sensors to shut off gas flow when the oven pilot light is out.

program now given that hundreds of thousands of pre-2003 vehicles remain on the road. The Alliance of Automobile Manufacturers reports that the national scrap rate for vehicles is 6.6%, which would suggest an average vehicle life of 15 years. If so, 1995 vehicles—a model year in which automakers were still installing relatively high numbers of mercury switches—will not arrive at the crusher until the year 2010.

VI. Conclusions

- DEP efforts to promote the switch removal program have been successful in that most ELV handlers are aware of the program and are removing switches. About 17,000 switches have been collected by Maine ELV handlers since January 1, 2003, when the program began. This represents roughly 30% of the switches thought to be available for capture during that time frame.
- Automakers have met their obligation to establish switch consolidation facilities and pay a $1 bounty on each switch delivered to the facilities. As a condition of paying the bounty, automakers require ELV handlers to submit the Vehicle Identification Number (VIN) of each source vehicle.
- The bounty was established to partially compensate ELV handlers for costs incurred to removing the mercury switches and transport them to a consolidation facility. In advising the Legislature to set the bounty amount at $1 per switch, the DEP considered only the time required to physically remove the switch from hood and trunk convenience light assemblies, a task that generally takes less than one minute. The time required to inspect each vehicle for mercury switch assemblies, and to properly manage the switches after they are removed, was not factored into cost estimates, nor was it anticipated that it would be necessary to record VINs.
- The bounty should be raised to more fairly compensate ELV handlers for the costs of removing and handling mercury switches. Raising the bounty will make switch removal less onerous for Maine businesses that scrap vehicles and will increase their buy-in to the removal effort.
- Although automakers no longer are putting mercury switches in motor vehicles, older vehicles in Maine are estimated to collectively contain over 200,000 mercury switches. The mercury in these switches will be released to the environment unless the switches are removed when the vehicles are scrapped.

VII. Recommendation

The DEP recommends that the mercury switch removal program be continued. We further recommend that 38 MRSA § 1665-A(5)(B) be amended to require automakers to pay a minimum of $3 for each mercury switch delivered to Wesco and a minimum of $4 if the VIN of each source vehicle must be provided to receive this payment.

APPENDICES

APPENDIX A

Maine law on mercury components in motor vehicles, 38 MRSA §1665-A

APPENDIX B

Proposed amendments to the law on mercury components in motor vehicles

APPENDIX C

Report on telephone survey of auto recyclers by the Natural Resources Council of Maine

APPENDIX D

Report on mail survey of auto recyclers by DEP consultant Market Decisions

APPENDIX E

U.S. District Court decision: *Alliance of Automobile Manufacturers v. Martha Kirkpatrick*

APPENDIX F

Report on New Jersey pilot project to collect mercury switches from motor vehicles

APPENDIX G

DEP informational mailings to ELV handlers

Press clippings